

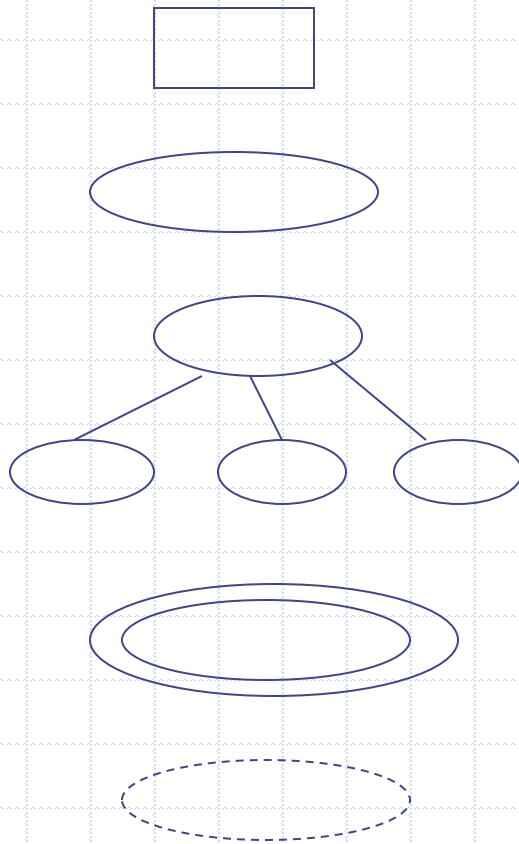
CSc 174

Database Management Systems

2. Review of Entity-Relationship Model

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ER Diagram For Entity and Attribute



Key



- ◆ A key is an attribute or the combination of multiple attributes that can be used to distinguish one entity instance from other entity instances in an entity type.
 - e.g. SSN of an employee
 - Composite attribute as a key, must be minimal

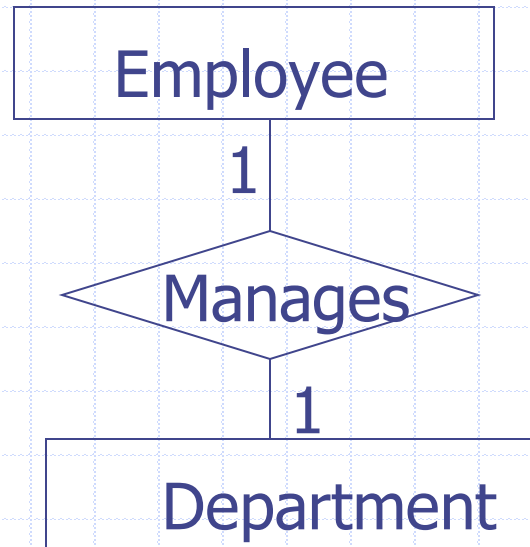
Structure Constraint

- ◆ Cardinality Ratios
- ◆ Participation Constraints

Cardinality Ratios for Binary Relationship

- ◆ Specify the the number of relationship instances that an entity can participate in.
- ◆ Possible cardinality ratios
 - 1:1 (one to one)
 - 1:N (one to many)
 - N:1 (many to one)
 - M:N (many to many)

Cardinality Ratio 1:1



Cardinality Ratio 1:N

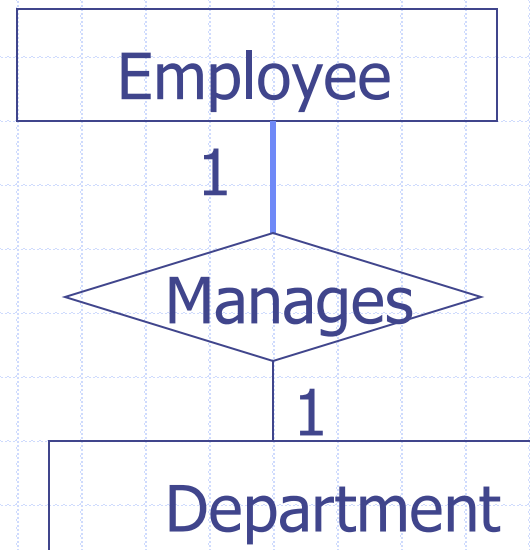
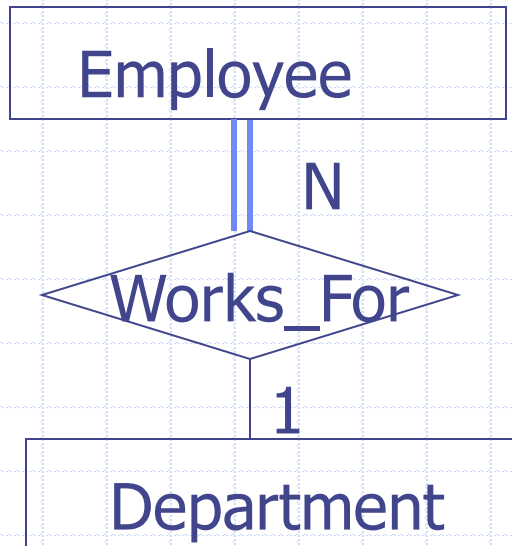
A department controls a number of projects. Each project is controlled by one department.

Cardinality Ratio M:N

A employee works on several projects. Many employee can work on one project.

Participation Constraints

- ◆ Total Participation (Existence dependency)
 - *Any* employee *must* work for one department.
- ◆ Partial Participation
 - *Some* of the employee entities manage department entities, but not necessary all.



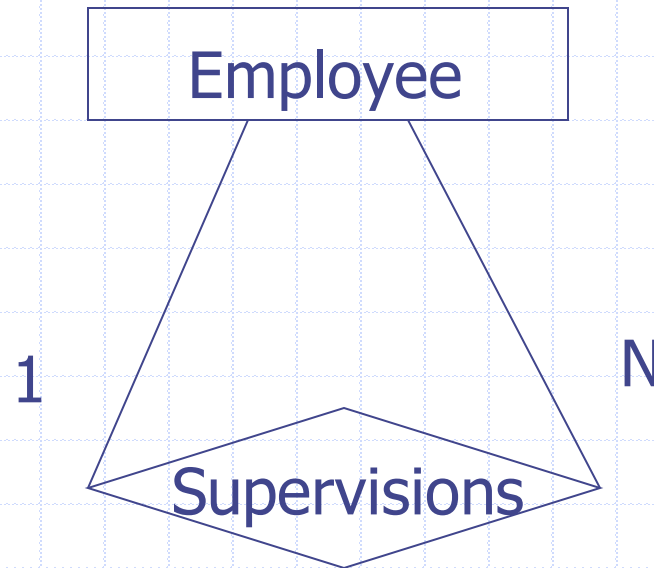
Weak Entity

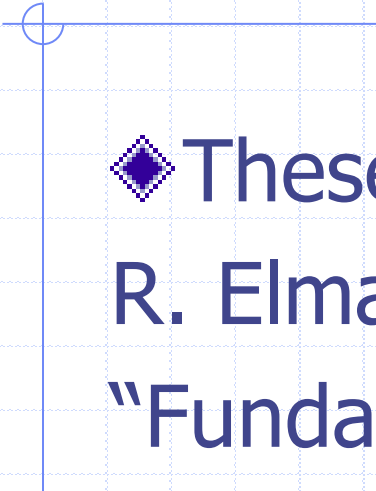
We store each employee's ssn(unique) and salary. A employee may have one or more dependent. We want to keep each dependent's first name and birth date.

Attributes for A Relationship

An employee works at least one projects. A project has at least one employee. We keep track of the number of hours per week that an employee works on each project.

Recursive Relationship





◆ These slides are based on the textbook:
R. Elmasri and S. Navathe,
“Fundamentals of Database Systems,”
Addison Wesley, 7th edition.